Morrison

DINOSAURS!

•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•

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IDENTIKIT

Animals on the ground, in the water and in the air

ANKYLOSAURUS 1489

DIPLOCAULUS 1492

PTERANODON 1493

PREHISTORIC WORLD

What the world was like when life began in

STEAMING INTO LIFE 1494

and in SHELLS ARRIVE 1496

SPOTTER'S GUIDE

The importance of hearing in

PRICK UP YOUR EARS 1502

TIME DETECTIVE

Discover the prehistoric animals still alive today in

'LIVING FOSSILS' 1504

HISTORY IN PICTURES

A DAY IN THE LIFE OF ICHTHYOSAURUS 1508

A to Z

Creatures beginning with the letters F and G 1512

ASK THE EXPERT

Dr David Norman of Cambridge University answers more of your dinosaur queries BACK COVER

PLUS

GIANTS OF THE PAST

An *Ankylosaurus* family fends off an attacking *Albertosaurus* 1498

3-D Gallery

Thirsty *Pinacosaurus* face danger from a fierce *Alectrosaurus* 1500

FACT FILE

Find out new facts, and try your skills with the weekly quiz 1510

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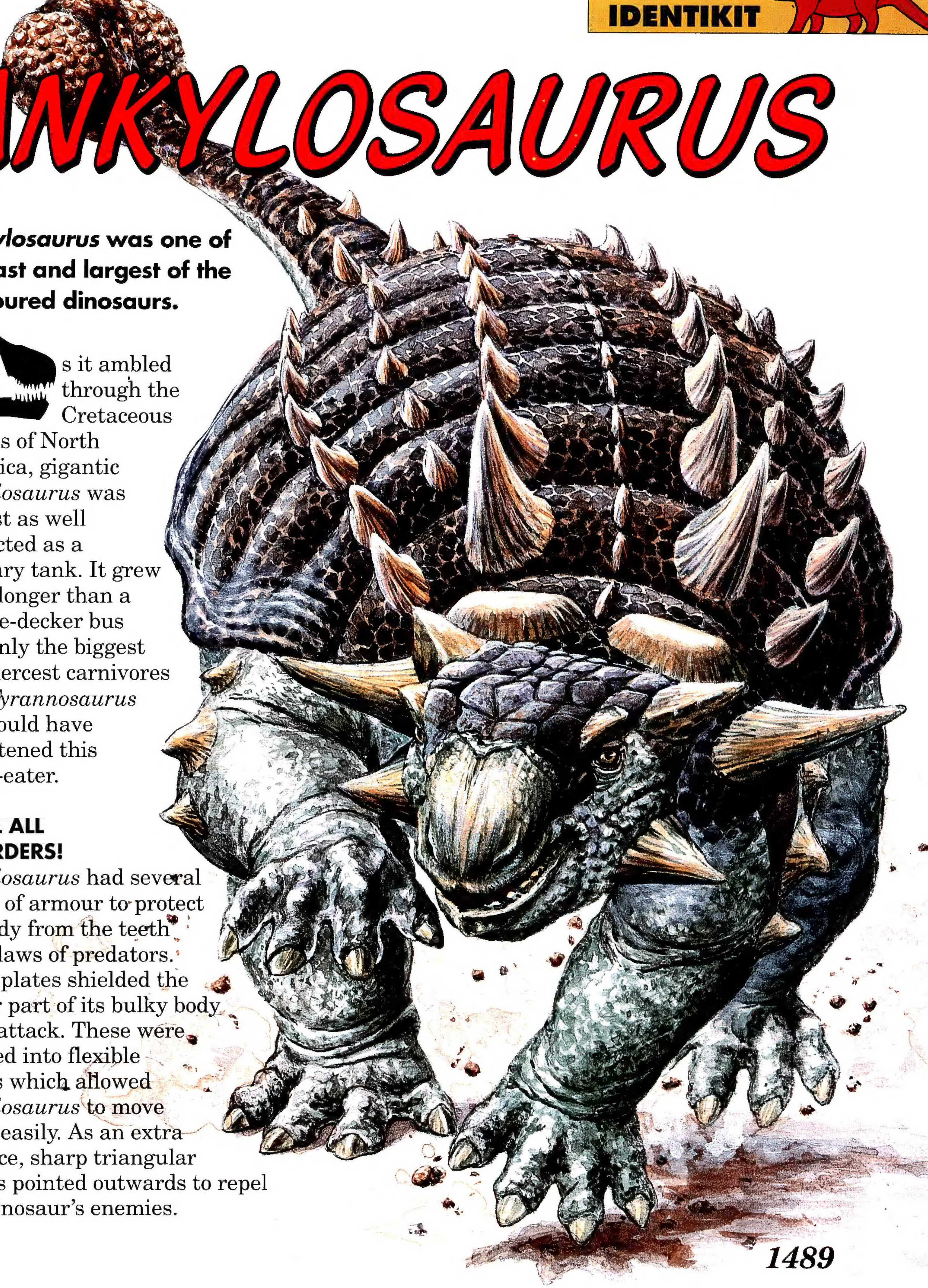
ANKYLOSAURUS



***Ankylosaurus* was one of the last and largest of the armoured dinosaurs.**

As it ambled through the Cretaceous forests of North America, gigantic *Ankylosaurus* was almost as well protected as a military tank. It grew to be longer than a double-decker bus and only the biggest and fiercest carnivores like *Tyrannosaurus rex* would have threatened this plant-eater.

REPEL ALL BOARDERS!

Ankylosaurus had several kinds of armour to protect its body from the teeth and claws of predators. Bony plates shielded the upper part of its bulky body from attack. These were divided into flexible bands which allowed *Ankylosaurus* to move quite easily. As an extra defence, sharp triangular spikes pointed outwards to repel the dinosaur's enemies.

Is it true that all ankylosaurids lived in North America?

No. There are only two well-known ankylosaurids that came from North America: *Euoplocephalus* and *Ankylosaurus*. Several more, including *Shamosaurus*, *Pinacosaurus* and *Saichania*, have been found in Asia. All these ankylosaurids have been found in rocks dating from the Cretaceous Period.

HARD HEADED

A blow to the head can be fatal but *Ankylosaurus*' skull was very well protected. Its head was almost as wide as it was long and was covered in bony plates which ran along the top and sides. On either side of its head, a pair of spikes added to *Ankylosaurus*' armoury. Its wide, toothless beak acted like a shovel and helped it to scoop up plants and branches.

LIFE-SAVER

Like other ankylosaurids, such as *Euoplocephalus* and *Saichania*, *Ankylosaurus* had a weapon at the end of its long tail.

WELL CLUBBED

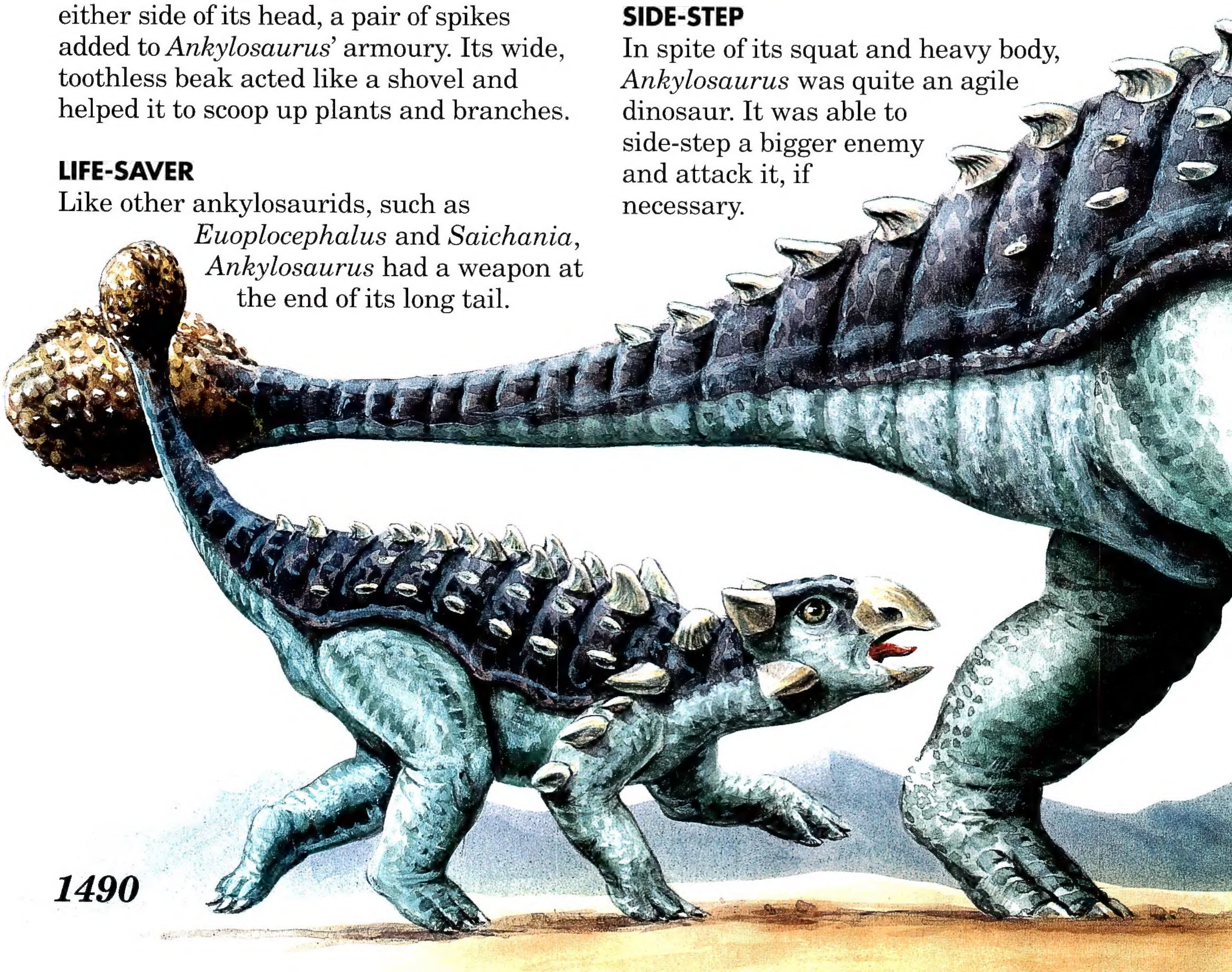
A heavy mass of bone grew out on either side of its tail bone to form a massive club as big as a large suitcase. This boulder-like growth was not for decoration. When attacked, it could save *Ankylosaurus*' life.

SWINGING ALONG

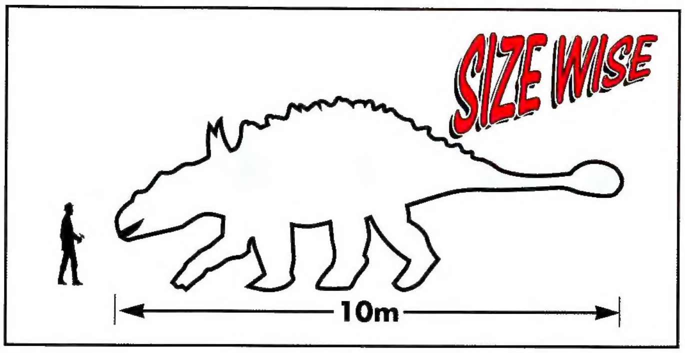
Strong muscles around its hips and along its tail helped *Ankylosaurus* to lift the club into the air and swing it at an enemy with great force. If a huge, two-legged predator received a leg-breaking blow from the tail club, the result was dramatic. The crippled creature toppled over and lay helplessly at the mercy of other carnivores while *Ankylosaurus* plodded off unharmed.

SIDE-STEP

In spite of its squat and heavy body, *Ankylosaurus* was quite an agile dinosaur. It was able to side-step a bigger enemy and attack it, if necessary.



A palaeontologist digs out the skull and skeleton of a *Saichania*, an ankylosaurid from Asia.



MONSTER FACTS

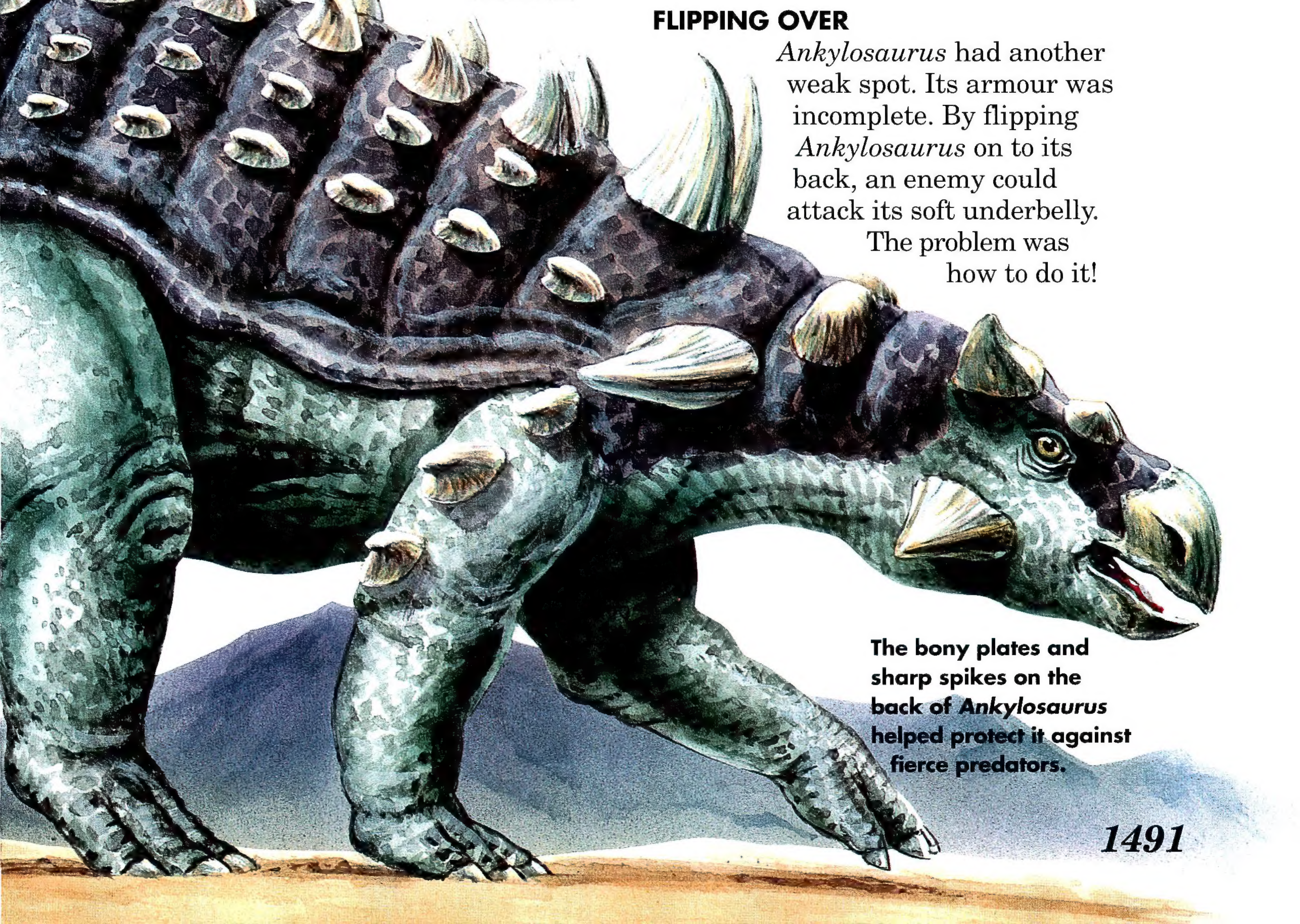
- **NAME:** *Ankylosaurus* (an-ky-low-saw-rus) means 'fused reptile'
- **GROUP:** dinosaur
- **SIZE:** 10m long
- **FOOD:** plants
- **LIVED:** about 80 million years ago in the Late Cretaceous Period in North America

NOT SPEEDY

Although *Ankylosaurus* could defend itself and was quite agile, it could not rely on its short, stocky legs for speed to outrun its enemies.

FLIPPING OVER

Ankylosaurus had another weak spot. Its armour was incomplete. By flipping *Ankylosaurus* on to its back, an enemy could attack its soft underbelly. The problem was how to do it!



The bony plates and sharp spikes on the back of *Ankylosaurus* helped protect it against fierce predators.

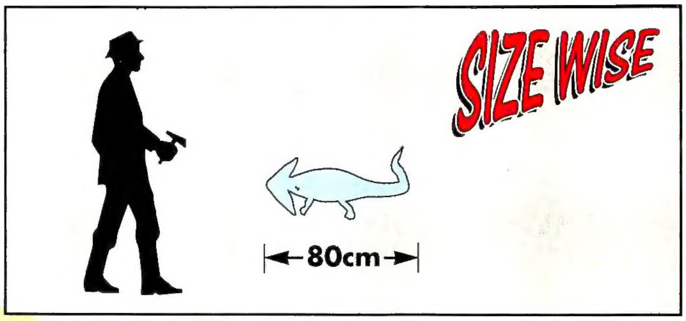
DIPLOCAULUS

***Diplocaulus* was an amphibian with an extraordinary-looking head, shaped rather like a boomerang.**

Found in the ponds and swamps of North America, *Diplocaulus* lived 270 million years ago. It was an amphibian and grew to be as long as a badger. It featured the same sprawled legs as those of a modern salamander or newt. But its head really set it apart – it was unlike that of any other known animal. On its head it had extraordinary wing-shaped bones that stuck out just like a huge boomerang. These grew out from what would have been *Diplocaulus*' cheekbones. As the head increased in size, so did these bones.

MONSTER FACTS

- **NAME:** *Diplocaulus* (di-plo-kawl-us) means 'two fold stem'
- **GROUP:** amphibian
- **SIZE:** 80cm long
- **FOOD:** fish
- **LIVED:** about 270 million years ago in the Early Permian Period in Texas, USA

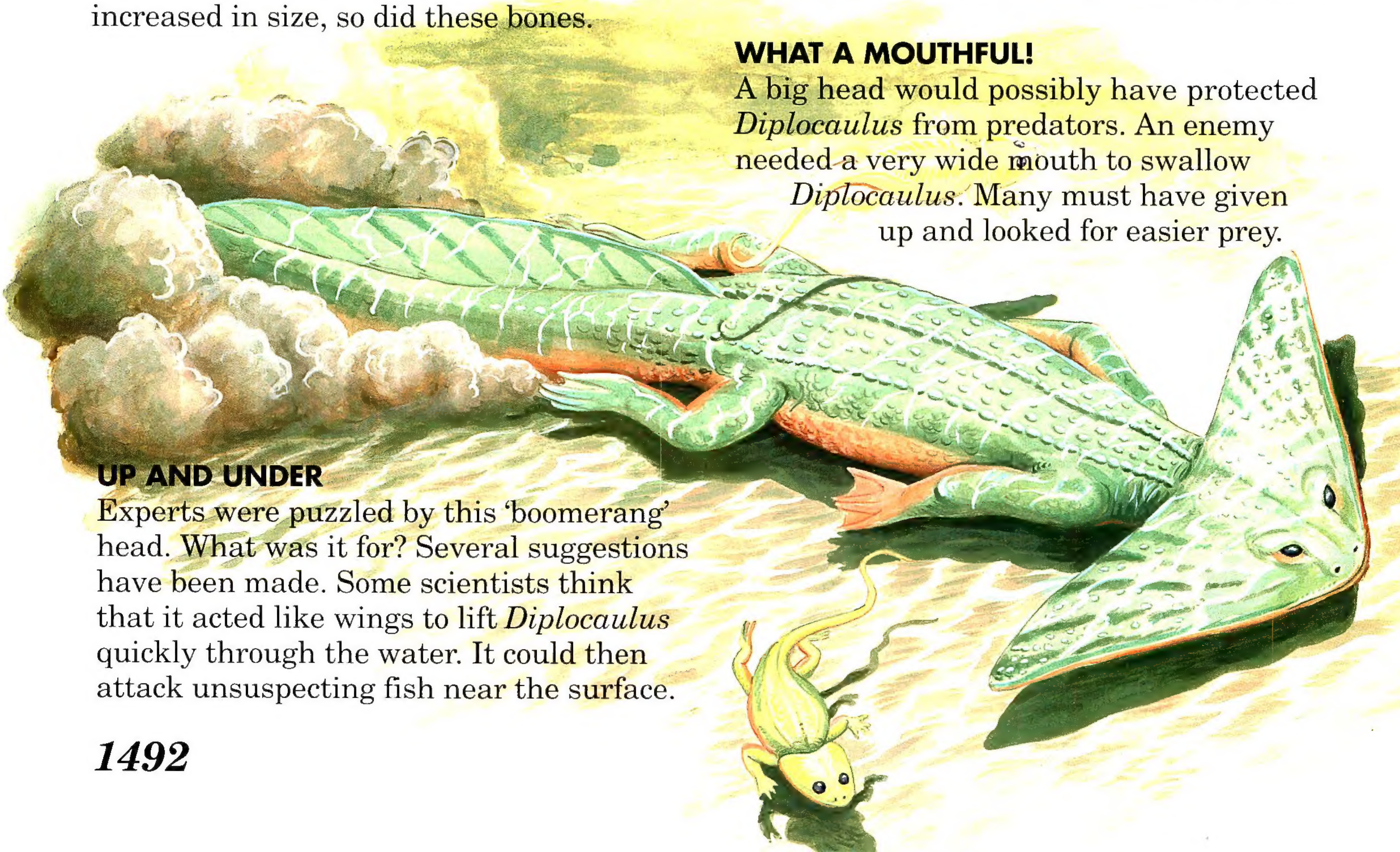


WHAT A MOUTHFUL!

A big head would possibly have protected *Diplocaulus* from predators. An enemy needed a very wide mouth to swallow *Diplocaulus*. Many must have given up and looked for easier prey.

UP AND UNDER

Experts were puzzled by this 'boomerang' head. What was it for? Several suggestions have been made. Some scientists think that it acted like wings to lift *Diplocaulus* quickly through the water. It could then attack unsuspecting fish near the surface.



PTERANODON

Although weighing only the same as a small child, *Pteranodon* had a wider wingspan than any known bird.

With a wingspan that would have stretched from the trunk to the tail of an elephant, *Pteranodon* must have cast a great shadow over its prey. It swooped down to catch fish, rather as an albatross does today.

DAINTY BONES

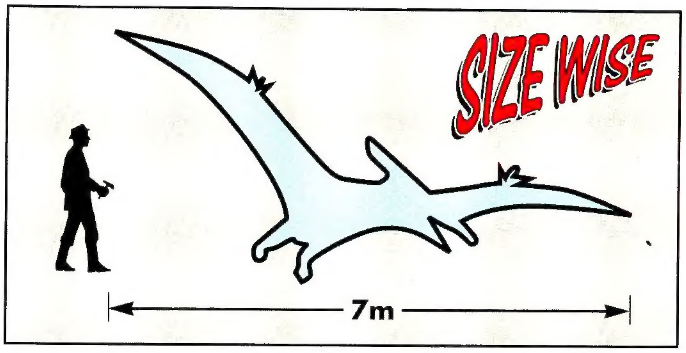
In spite of its immense size, *Pteranodon* was only about as heavy as a small child. This was because it had light, hollow bones. The arrangement of its joints and muscles meant that *Pteranodon* could flap its wings as it flew.

TOP CREST

Pteranodon had a narrow, bony crest at the back of its head, and a long, toothless beak at the front.

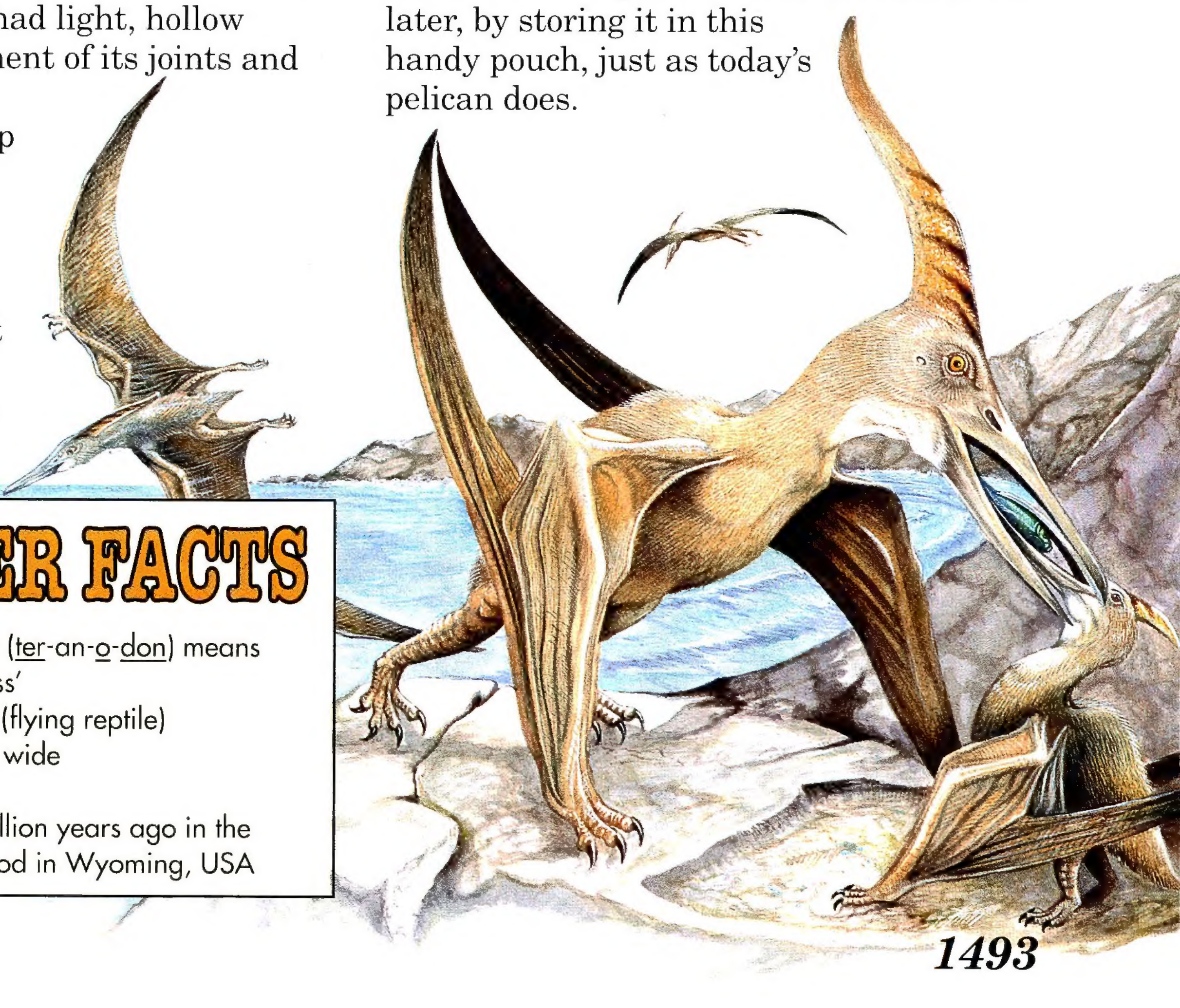
MONSTER FACTS

- **NAME:** *Pteranodon* (ter-an-o-don) means 'winged and toothless'
- **GROUP:** pterosaur (flying reptile)
- **SIZE:** wingspan 7m wide
- **FOOD:** fish
- **LIVED:** about 70 million years ago in the Late Cretaceous Period in Wyoming, USA



FLIGHT PATH

Some experts think that the crest helped *Pteranodon* change direction as it flew. Inside its horny beak and between its lower jaws, there was a pouch of skin. When it scooped up its prey from the sea, *Pteranodon* may have saved the fish to eat later, by storing it in this handy pouch, just as today's pelican does.



Steaming into life

The Precambrian is the earliest period. It makes up 88 per cent of the Earth's history! Yet we know little about it.

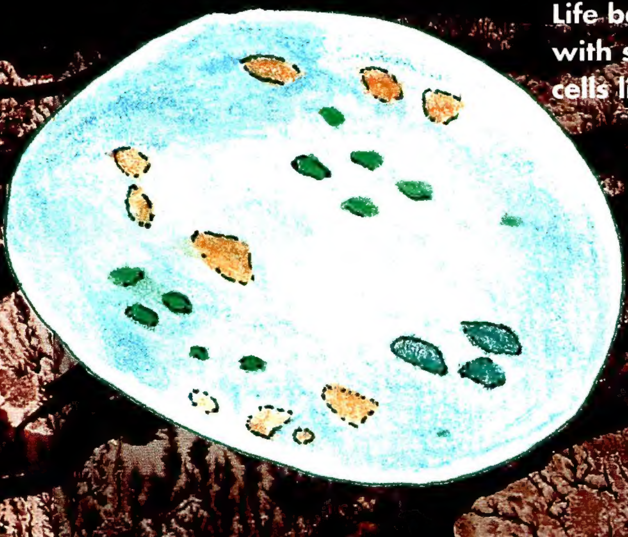
The sky is dark, lightning flashes and the rain lashes down. The rocks are hot under foot – so hot that the rain evaporates to form steam as soon as it hits them.

WHERE ARE WE?

The air is thick with steam, and with deadly gases which seep and gasp from the volcanoes. Nothing can possibly live here. Where are we? Venus? Mars? No. This is our own planet Earth – 4,800 million years ago.

IN THE BEGINNING...

Scientists think that about 4,600 million years ago, the Earth formed from cold dust. The mass of dust began to heat up as it was crushed together by gravity. Then the dust began to melt and turned to rock.



Life began with single cells like this.

These sulphur-rich hot springs are in Iceland. The first living things on Earth probably developed in conditions as harsh as these.

THE FIRST ATMOSPHERE

The gases that formed the first atmosphere were mainly poisonous – methane and hydrogen. More gases, including carbon dioxide and water vapour, seeped to the surface through volcanoes, and, as the Earth cooled, the water vapour turned back to water.

WATERY HOME

When the surface was cool enough, the water began to gather in hollows which enlarged to form the first oceans. We think that life began as soon as the surface was cool enough to hold water.

FIRST LIVING THINGS

The first living things would have been tiny molecules, tinier than the eye can see. These molecules could produce copies of themselves. They were the first life, although nothing like the animals we know today.

LOTS OF STRANGE ANIMALS

The animal life during the Cambrian Period was amazingly varied. The Burgess Shale, which was once beneath the oceans and now forms part of the Canadian Rockies, shows us what life was like. Here thousands of strange little animals – both soft-bodied and hard-shelled – were engulfed by a mud-slide which preserved them perfectly.

ALL OVER THE WORLD

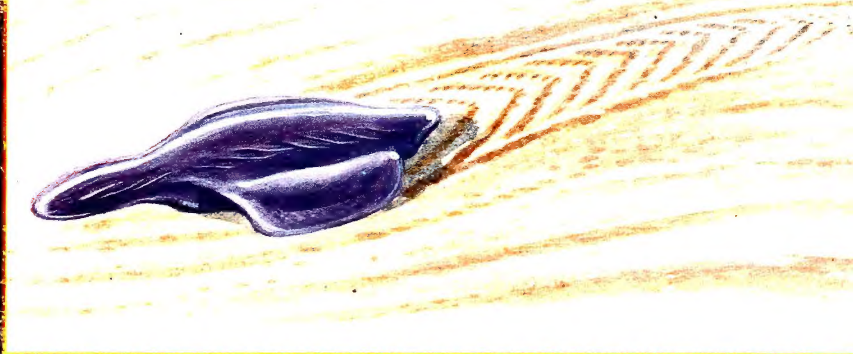
In the Cambrian rocks we can see that many of the groups of animals that are alive today had begun to appear. There were the shelled molluscs with tentacles, which evolved into today's clams and winkles, and the joint-legged arthropods, which evolved into today's crabs and lobsters. The spiny starfishes and sea urchins, the corals, sponges and worm-like creatures, also appeared at this time.

THE NAME

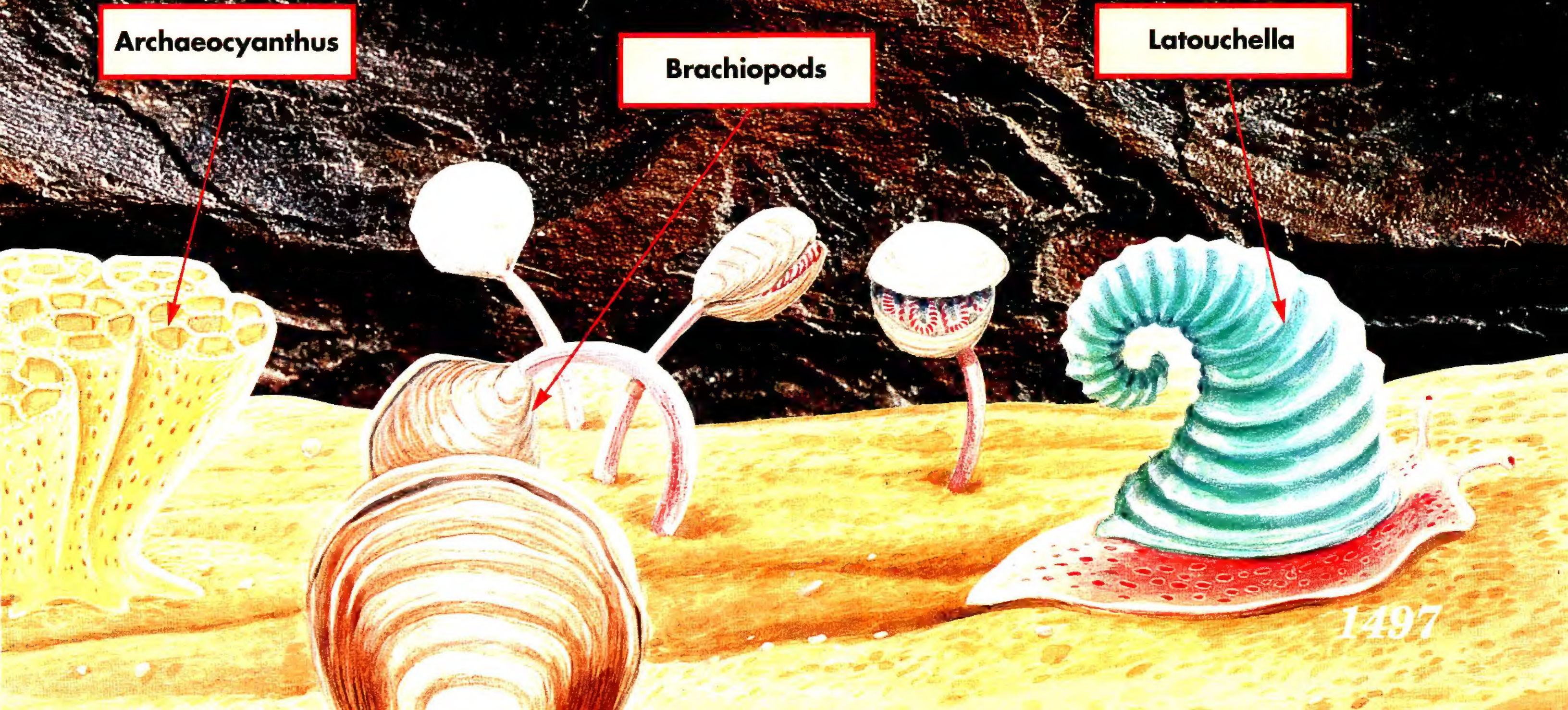
Cambrian rocks were first studied in Wales. They took their name from 'Cambria' – the ancient name for Wales.

Is it true that there were no land-living animals in the Cambrian Period?

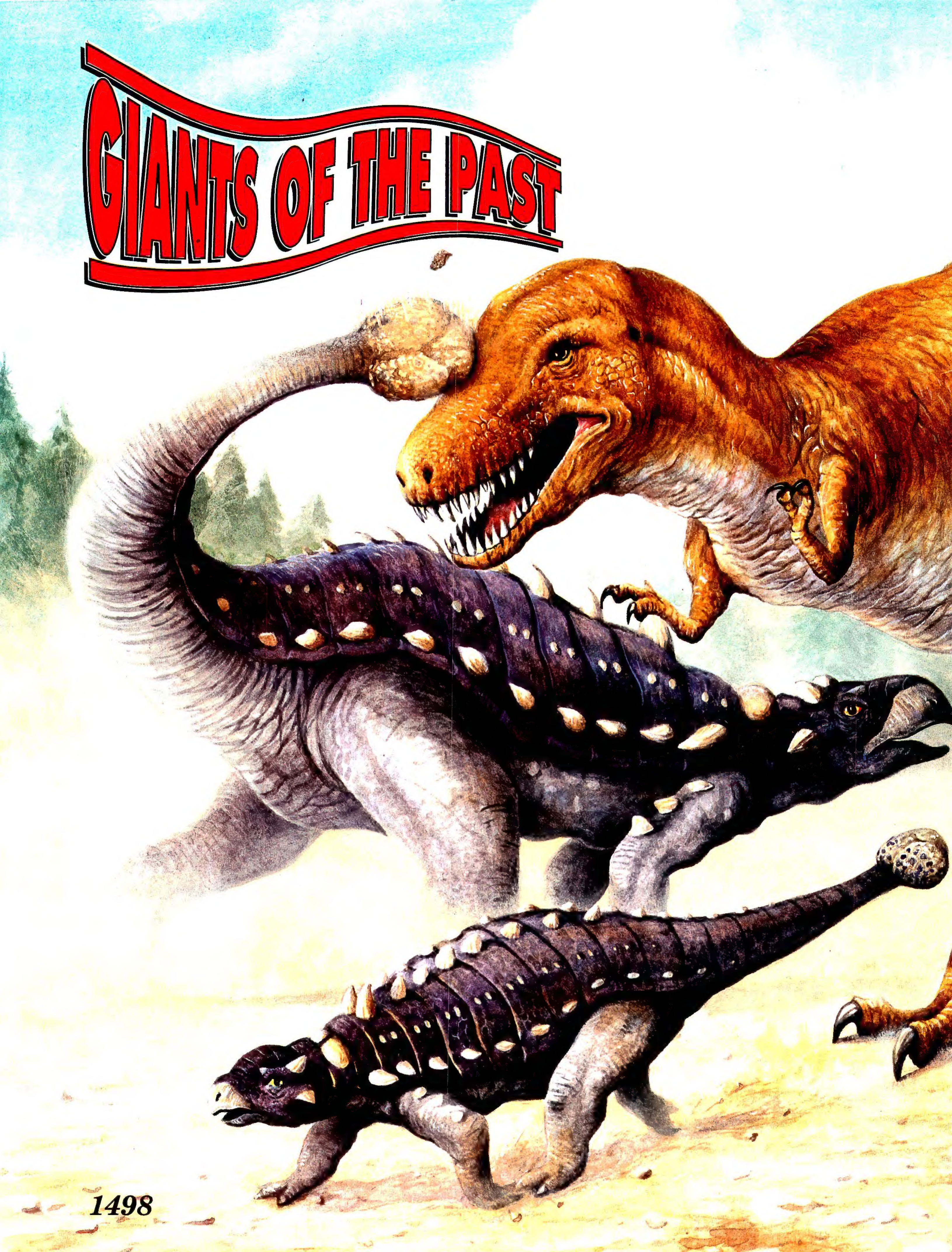
Not really. Nothing lived full-time on land but there are fossils of tracks laid down on a beach. These fossils are called *Climactichnides* and look like motorcycle tyre tracks. They would have been made by some shallow-sea animal that dragged itself out of the water for a while. *Climactichnides*, shown here, would have been about 30cm long.



An important type of shellfish was a creature called a brachiopod. Brachiopods developed a hard shell, just like today's shelled molluscs, because they had the same way of life – sitting on the sea floor and filtering food out of the water. Fossilized brachiopods are shown in the background picture on this page.



GIANTS OF THE PAST



Fossil stromatolites in Australia show that single-celled creatures lived over 3,000 million years ago.

IT'S A FACT

A NEW NAME

Scientists used to call the single-celled stromatolite-builders 'blue green algae' but the more modern name is 'cyanobacteria'.

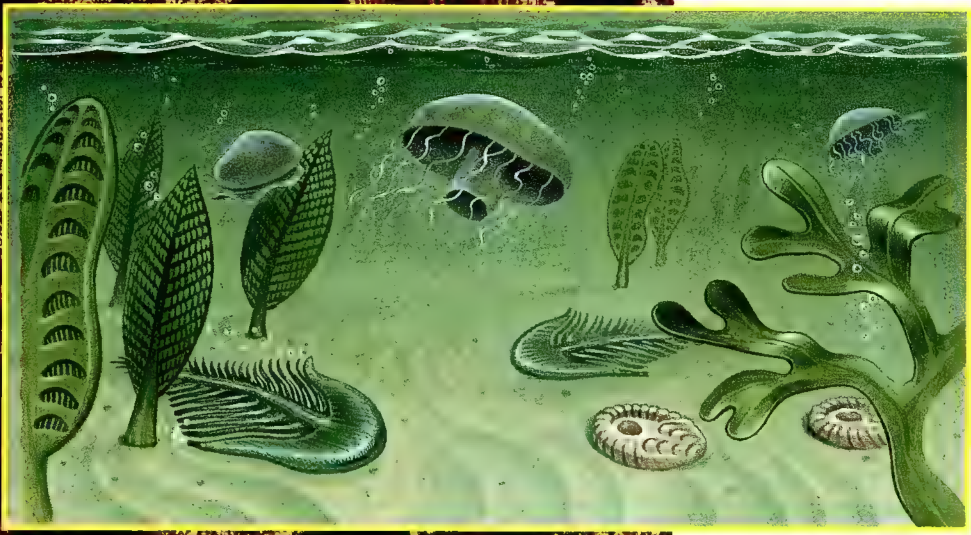
LITTLE PACKETS OF LIFE

As time went on, these molecules became more and more complex, and eventually the first cells developed. A cell is the basic building brick of all living things. It contains all the living material and all the molecules, and it can copy itself. A cell is encased in a tiny sack. Some living things consist of only one cell, but most, including ourselves, contain millions and millions.

TRAPPED IN MUD

Scientists have found what seem to be the fossils of single cells in ancient rocks in Western Australia, dating from over 3,000 million years ago. These single-celled creatures are called stromatolites.

These 600 million year-old soft-bodied creatures, like sea-pens and jellyfishes, are called the Ediacara animals, after the area in Australia where they were first discovered.



A DEVELOPING ZOO

The earliest many-celled animals do not seem to have appeared until about 700 million years ago. Then, from rocks around the world, we can find fossils of soft-bodied animals, such as jellyfish, worms and sea-pens. All this was happening in the sea. But what lived on land at this time? Nothing.

Shells arrive

In the Cambrian Period, animals in the sea developed hard shells. But there were no plants, and no life on land at all.

In the Cambrian Period something strange happened. All sorts of animals suddenly developed hard shells. We are not sure why. Perhaps the salts in the sea water enabled animals to absorb chemicals and lay down hard layers in their skin.

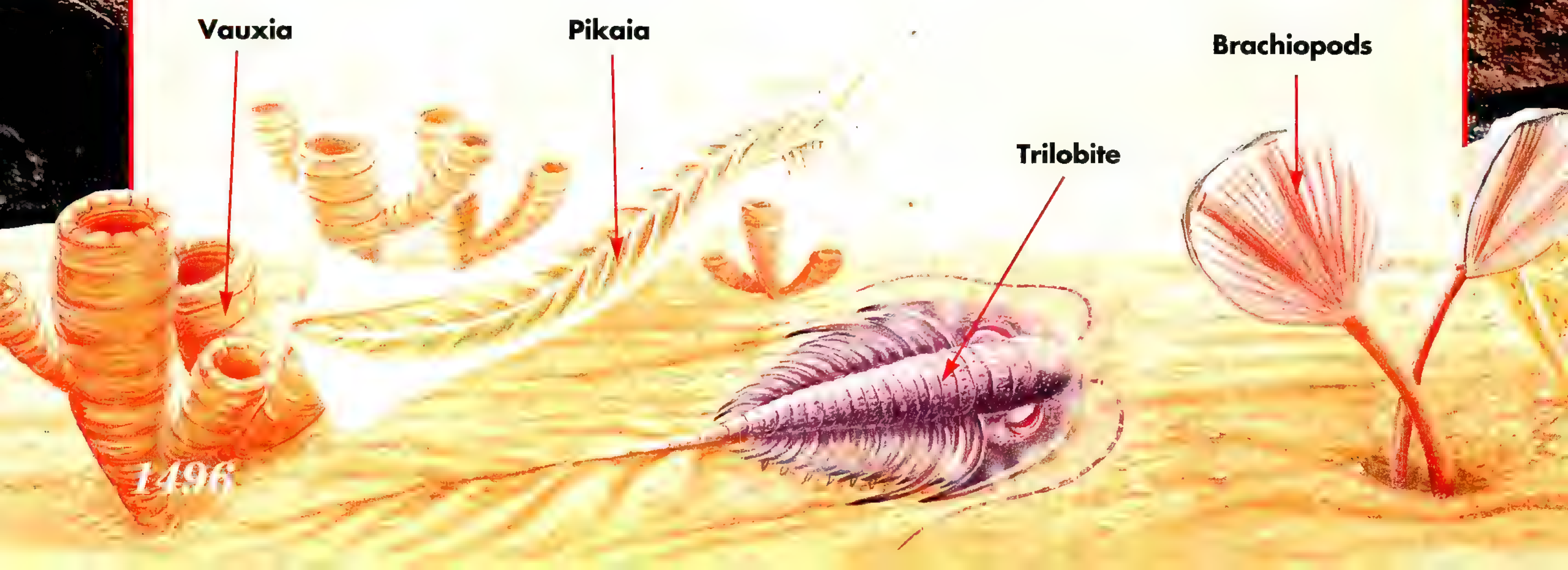
THE START OF THE FOSSIL RECORD

Hard shells fossilise better than soft bodies, so rocks from this time are full of fossils. This event – 570 million years ago – marks the beginning of the geological time we call the Cambrian Period.

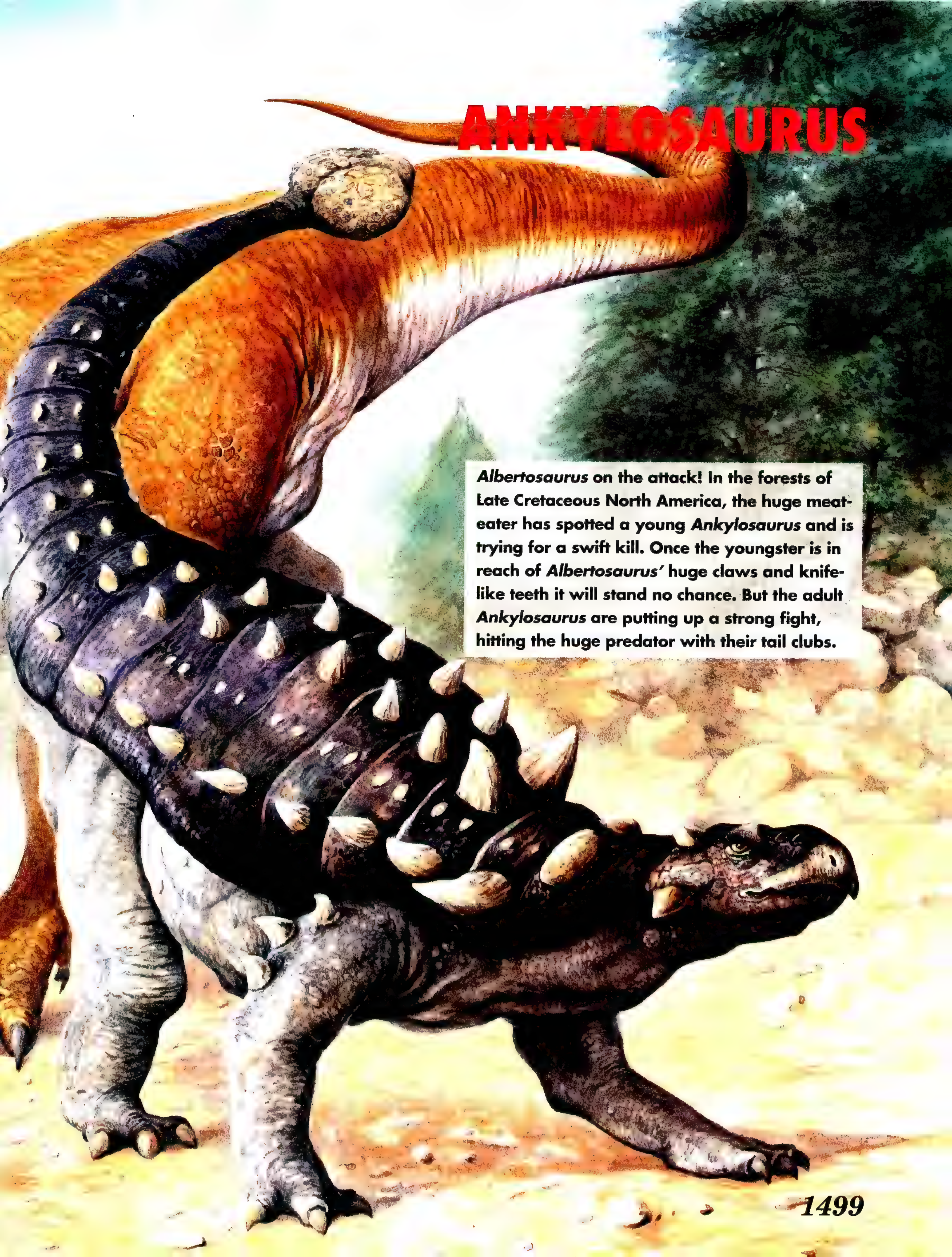
A DIFFERENT WORLD

If we looked at our world from space during the Cambrian Period we would not be able to recognise very much. There would be the vast blue of the ocean, and a few fluffy white clouds. But the continents would have been a totally different shape, with no green on them – they would have been just naked, brown rock.

In Cambrian times the world's continents were spread out along the Equator. There were many shallow seas at the continents' edges and most of the fossils that we know are preserved on the shallow-water deposits formed here.



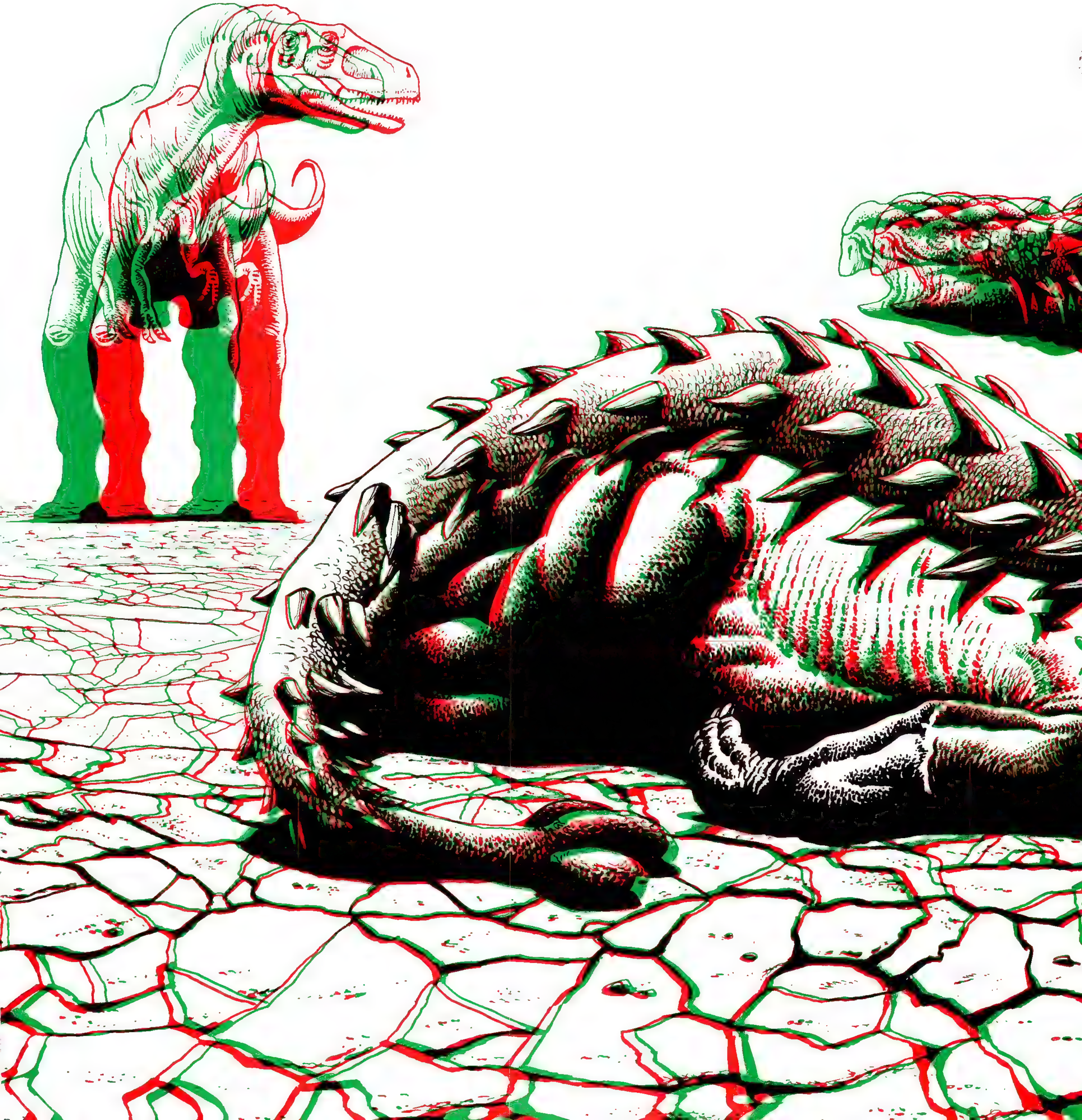
ANKYLOSAURUS



Albertosaurus on the attack! In the forests of Late Cretaceous North America, the huge meat-eater has spotted a young *Ankylosaurus* and is trying for a swift kill. Once the youngster is in reach of *Albertosaurus'* huge claws and knife-like teeth it will stand no chance. But the adult *Ankylosaurus* are putting up a strong fight, hitting the huge predator with their tail clubs.

3-D Gallery 72

PINACOSAURUS



On a dried-out lake bed in Late Cretaceous Mongolia, two *Pinacosaurus* are dying of thirst. They have come for water only to discover that the lake is dry. Weak, and lacking the strength to defend themselves, they will be easy prey for a hungry *Alectrosaurus*.

Prick up your ears

Prehistoric mammals could hear a wide range of sounds – from the shrillest squeak to the deepest rumble.

Unlike dinosaurs, prehistoric mammals had fleshy ears on the outside of their heads. Like mammals now, they could prick up their ears and even swivel them around to help them hear better.

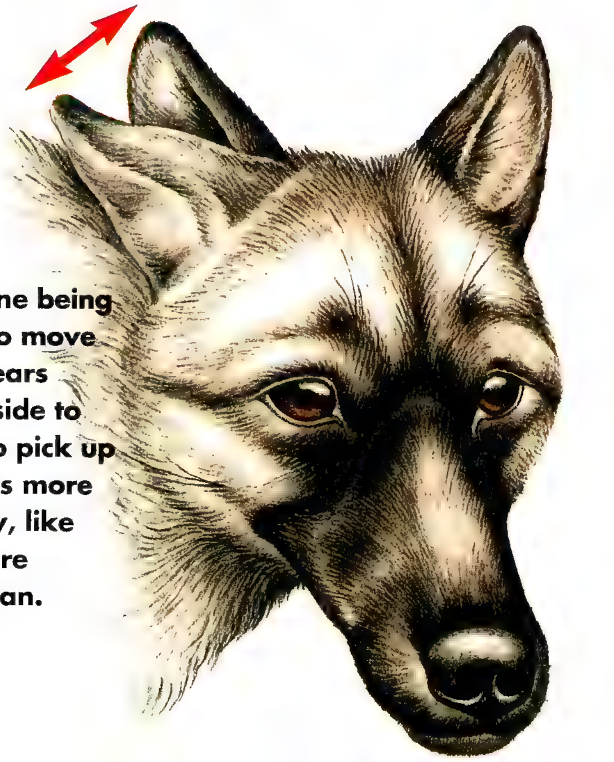
***Cranioceras* could swivel its big ears to listen out for enemies.**

SOUND TRAP

Human ears are small, flat and barely move at all. Big ears are much more effective, collecting a wider range of noises to funnel into the earholes. Animals with very large ears use them rather like satellite dishes to home in on their prey.

CAUGHT IN THE WAVES

Bats today have incredibly good hearing. Millions of years ago, the first bats were just as sharp-eared. *Icaronycteris* (ih-car-on-ik-ter-is) lived more than 65 million years ago. Like today's bats, it probably found its prey by a system called echolocation. As they fly, bats send out bursts of very high frequency sound. Anything in the path of the soundwaves sends back an echo to the bat's big ears. This helps the bat to locate the object and, if it is an insect, to swoop in and eat it.



Imagine being able to move your ears from side to side to pick up sounds more clearly, like this Dire wolf can.

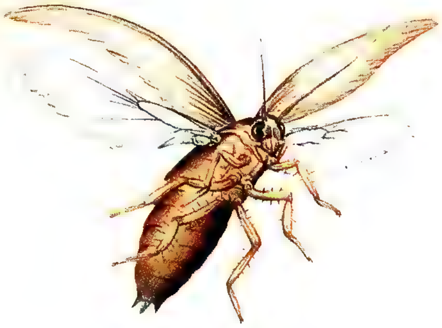
RUMBLING ABOUT

Today's elephants and other large animals may be able to hear lower sounds than humans. One of the earliest elephants, *Deinotherium* (dine-oh-thee-ree-um), was gigantic. It lived 40 million years ago and was twice as tall as a man. Like today's elephants, it could probably hear very low sounds. And it could communicate with other *Deinotherium* in low sounds too. These sounds are pitched so low that human ears are unable to pick them up. But we can sometimes feel the sounds as a strange, rumbling sensation.

RECORD BREAKERS

- The jack rabbit has the longest ears of any rabbit. They are over [illegible] long.
- An African elephant (left) has the largest ears in the world. Each one measures up to 1.8m wide.
- A long-eared bat has the largest ears compared to its body size. Its ears are around 4cm long and its body only 5cm long.

Bats hunt in the dark and live in dark places, such as caves. They catch their prey, and find their way around in the dark, by sending out powerful bursts of sound that are too high-pitched for the human ear to pick up. These soundwaves travel out from the bat's mouth, sending an echo back to its ears if they hit anything. That is how bats can fly in the dark without bumping into things, and how they catch insects they cannot see!

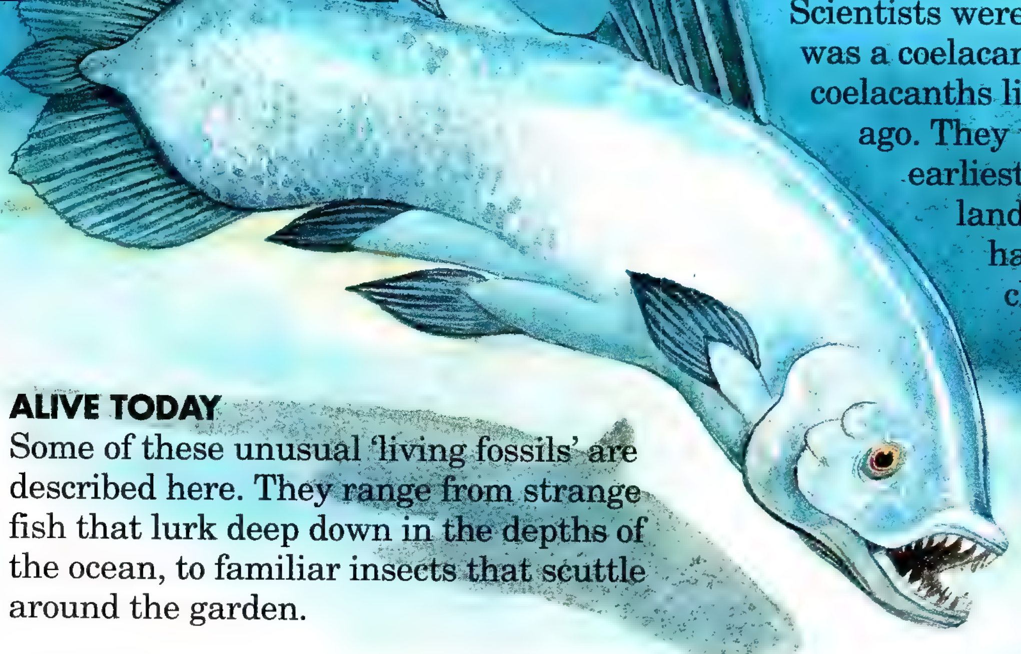


‘Living fossils’

A small number of plants and animals have barely changed since prehistoric times – we call them ‘living fossils’.

Animal and plant species usually survive for a time and then they die out. Normally a species exists for a few million years and then its place is taken by new, more successful types. But some species seem to change very little.

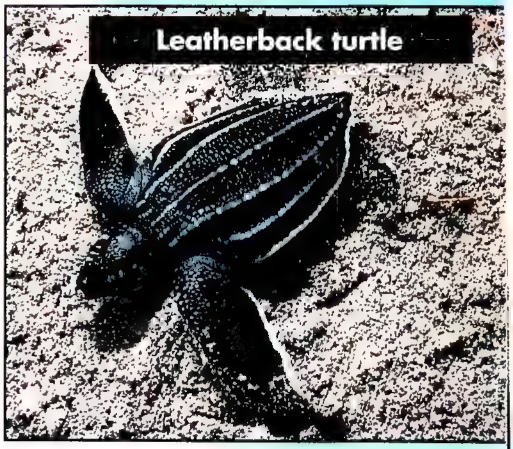
The coelacanth today (left) has changed little from its ancestor (below) which lived 400 million years ago.



ALIVE TODAY

Some of these unusual ‘living fossils’ are described here. They range from strange fish that lurk deep down in the depths of the ocean, to familiar insects that scuttle around the garden.

IN THE SWIM



Leatherback turtle

Turtles are surviving members of a very ancient group of reptiles. One of the largest prehistoric turtles was the giant *Archelon*, which lived 80 million years ago. It grew up to 3.7m long. Like the living leatherback turtle, it probably had a thick coat of rubbery skin which hung from its bony frame. *Archelon* had a sharp beak too, and probably fed on jellyfish – just as the leatherback does. Turtles have stayed the same for so long because they have no natural enemies.

DEEP DOWN

A weird-looking fish was caught off the coast of South Africa over 50 years ago. Scientists were thrilled to discover it was a coelacanth. The first coelacanths lived 400 million years ago. They were related to the earliest fishes that walked on land. Coelacanths seem to have survived so well and changed so little because they live in the deep waters of the Indian Ocean, where they are almost alone and without competitors. They are an extremely rare type of fish even today.

Archelon

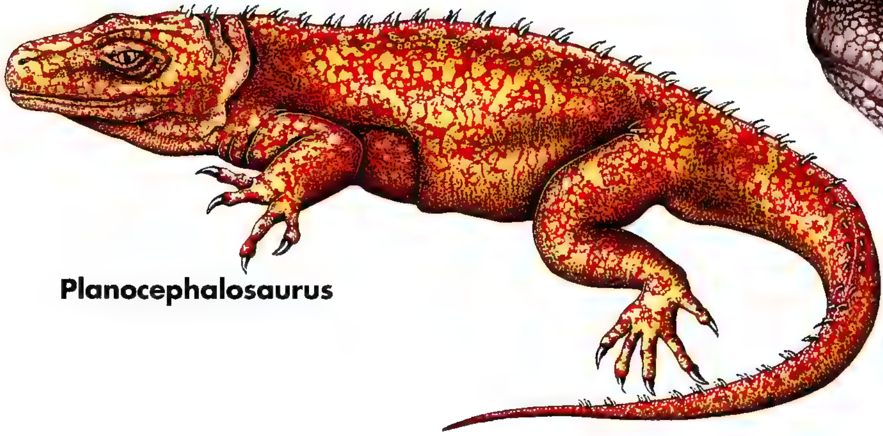
IT'S A FACT

TIME WARP

'Living fossils' are very important to scientists. Although they are not exactly the same as their fossil ancestors, experts can get important clues from them, indicating how their ancestors lived many millions of years ago.

SPINY BACK

The tuatara, or 'spiny back', is another 'living fossil'. It is a large lizard and is the only survivor of the 'beak-head' reptiles, such as *Planocephalosaurus,* which lived more than 200 million years ago. These reptiles lived all around the world but disappeared when today's lizards and snakes appeared. Now the tuatara lives on just a few islands off the coast of New Zealand.



Planocephalosaurus

***Necrolemur* was an early tarsier.**

GONE APE

Some tropical islands off the coast of south-east Asia are home for another 'living fossil'. It is the tarsier, which lives in the forest and comes out to feed at night. The tarsier is little changed after 45 million years on Earth. With its large, forward-pointing eyes and short jaw, it does not look much like a monkey. But some scientists think ancient, tarsier-like animals may have been the ancestors of today's apes. In the past, tarsier-like animals lived right across the world.

This tuatara is a direct descendant of the beak-head reptile, *Planocephalosaurus.*

SLOW SHUFFLE

Shuffling across the shallows of some North American and Indian seashores is another 'living fossil'. It is the horseshoe crab, which has hardly changed over 430 million years. Horseshoe crabs are not true crabs. They are related to spiders and scorpions. One of the main reasons why they have survived for so long is that they are protected by their hard shells. Many attackers simply may have felt they were not worth bothering about. Under the horseshoe crab's tough outer casing is only a very small body.

Horseshoe crab

SCUTTLING AROUND

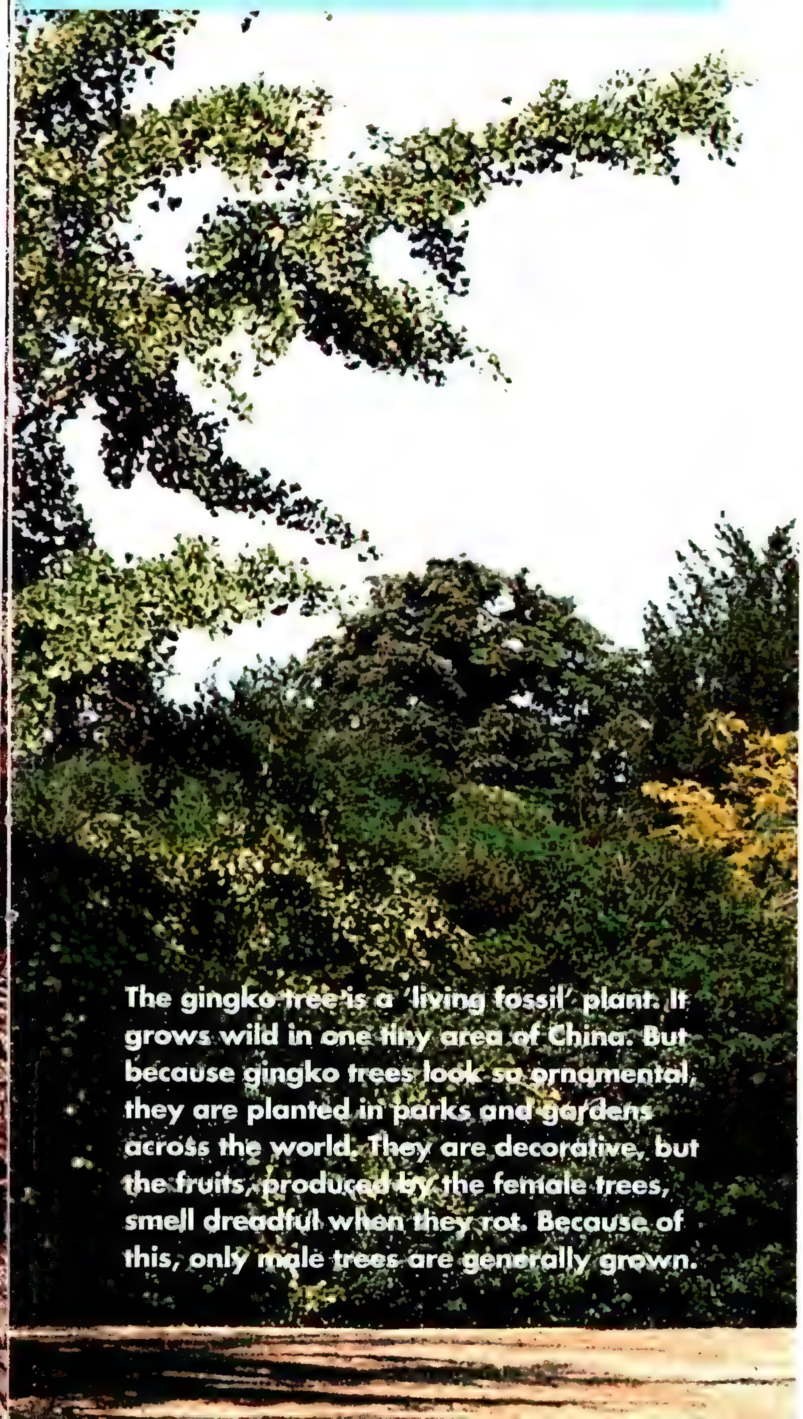
The familiar ground beetle that scuttles about the garden has looked the same for around 230 million years. *Protorabus* was the first-known ground beetle. Fossils 135 million years old have been found in central Asia. Prehistoric ground beetles must have fed on insects and grubs, just like today's ground beetles. They have survived well because they are successful hunters.

IT'S A FACT

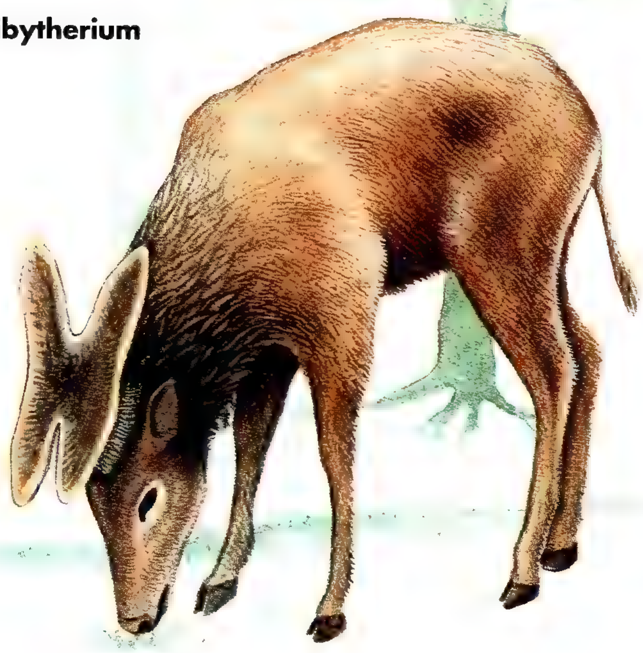
SHARKS THE SAME?

Today's sharks are 'living fossils' that have stayed more or less the same since prehistoric times. The teeth of today's Port Jackson shark are almost identical to fossilized shark teeth that are 150 million years old.

Ground beetle



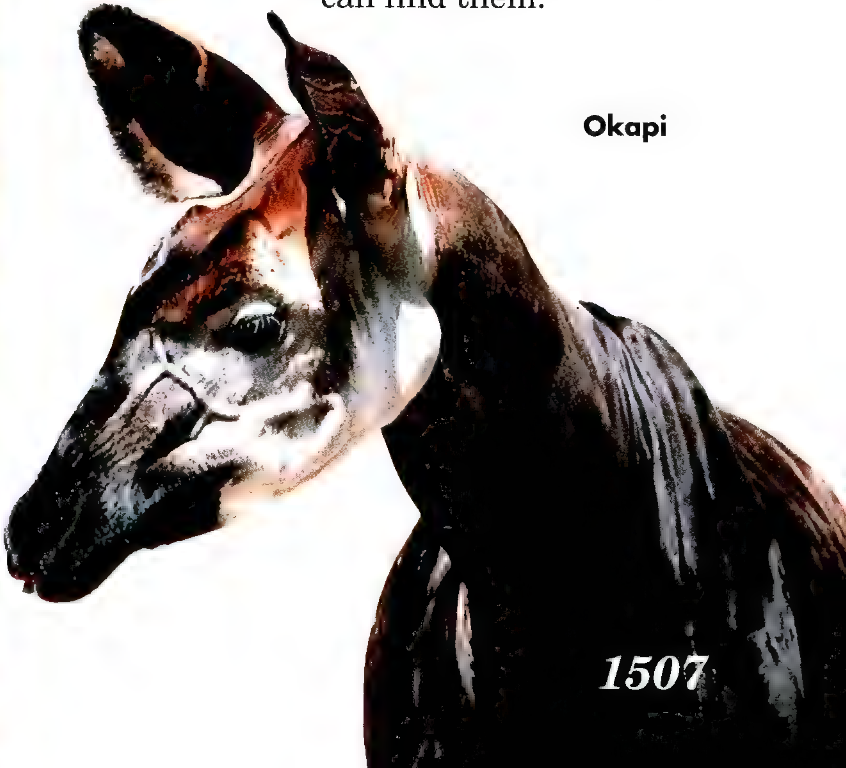
The gingko tree is a 'living fossil' plant. It grows wild in one tiny area of China. But because gingko trees look so ornamental, they are planted in parks and gardens across the world. They are decorative, but the fruits, produced by the female trees, smell dreadful when they rot. Because of this, only male trees are generally grown.



Prolibytherium

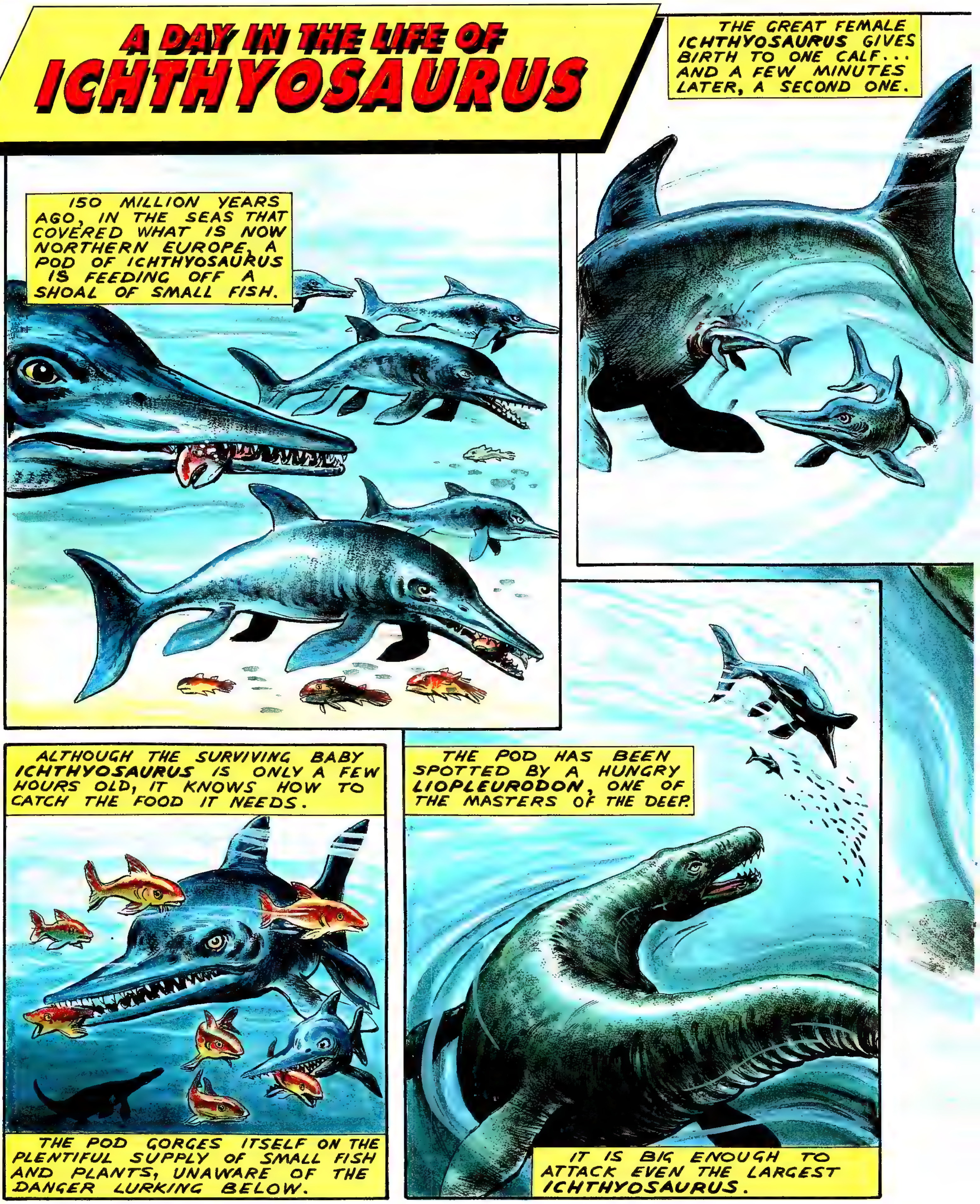
PIGMY PREY

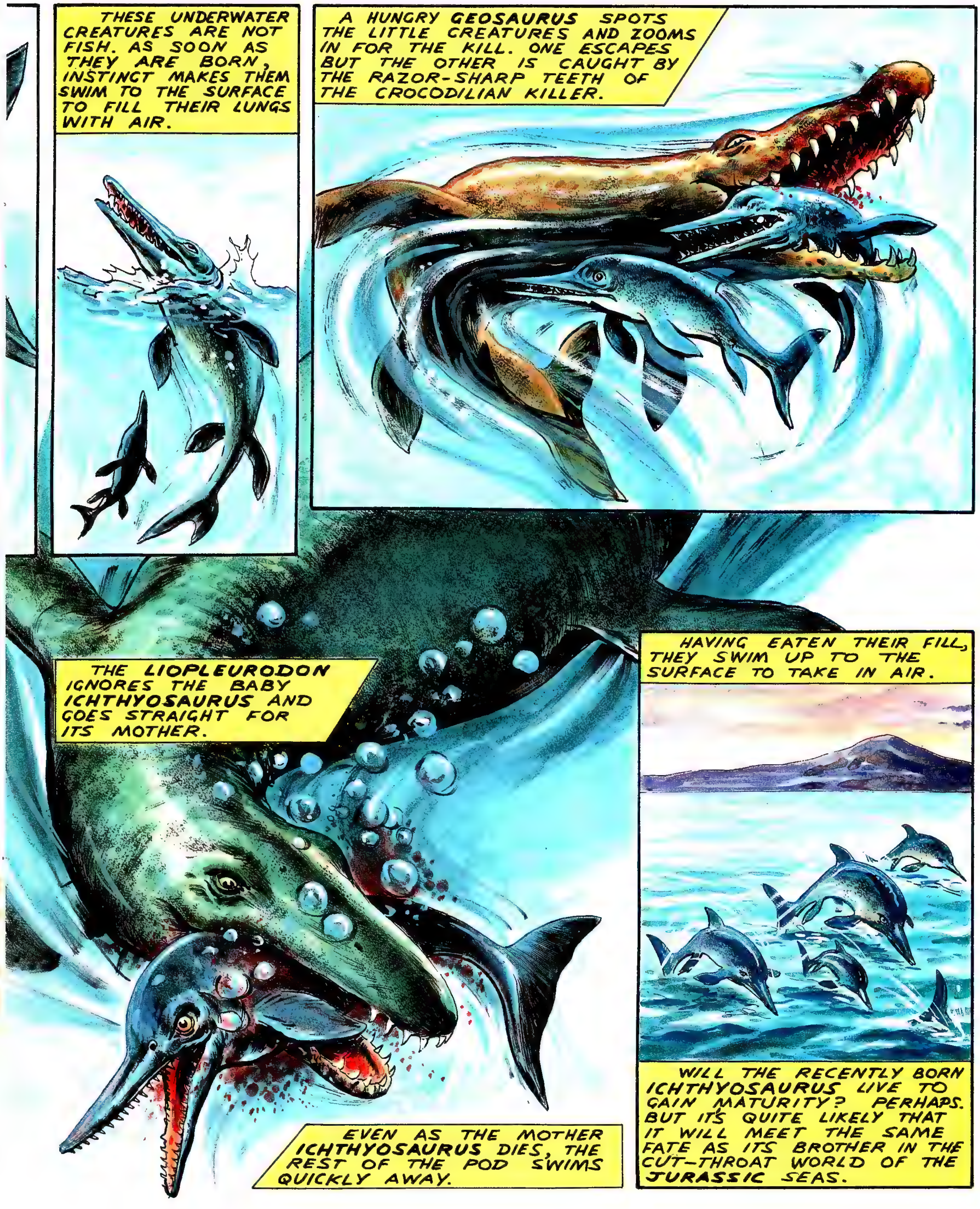
The last large animal to be discovered by scientists was found only about 100 years ago. It was the okapi, a primitive kind of giraffe, which has survived from prehistoric times. The earliest member of the okapi family was *Prolibytherium*, which lived 25 million years earlier. It had huge, leaf-shaped antlers. But apart from that it looked very like an okapi today. Okapis now live deep in the forests of Africa where few predators can find them.



Okapi

A DAY IN THE LIFE OF ICHTHYOSAURUS


150 MILLION YEARS AGO, IN THE SEAS THAT COVERED WHAT IS NOW NORTHERN EUROPE, A POD OF ICHTHYOSAURUS IS FEEDING OFF A SHOAL OF SMALL FISH.
THE GREAT FEMALE ICHTHYOSAURUS GIVES BIRTH TO ONE CALF... AND A FEW MINUTES LATER, A SECOND ONE.
ALTHOUGH THE SURVIVING BABY ICHTHYOSAURUS IS ONLY A FEW HOURS OLD, IT KNOWS HOW TO CATCH THE FOOD IT NEEDS.
THE POD GORGES ITSELF ON THE PLENTIFUL SUPPLY OF SMALL FISH AND PLANTS, UNAWARE OF THE DANGER LURKING BELOW.
THE POD HAS BEEN SPOTTED BY A HUNGRY LIOPLEURODON, ONE OF THE MASTERS OF THE DEEP.
IT IS BIG ENOUGH TO ATTACK EVEN THE LARGEST ICHTHYOSAURUS.


THESE UNDERWATER CREATURES ARE NOT FISH. AS SOON AS THEY ARE BORN, INSTINCT MAKES THEM SWIM TO THE SURFACE TO FILL THEIR LUNGS WITH AIR.
A HUNGRY **GEOSAURUS** SPOTS THE LITTLE CREATURES AND ZOOMS IN FOR THE KILL. ONE ESCAPES BUT THE OTHER IS CAUGHT BY THE RAZOR-SHARP TEETH OF THE CROCODILIAN KILLER.
THE **LIOPLEURODON** IGNORES THE BABY **ICHTHYOSAURUS** AND GOES STRAIGHT FOR ITS MOTHER.
HAVING EATEN THEIR FILL, THEY SWIM UP TO THE SURFACE TO TAKE IN AIR.
WILL THE RECENTLY BORN **ICHTHYOSAURUS** LIVE TO GAIN MATURITY? PERHAPS. BUT IT'S QUITE LIKELY THAT IT WILL MEET THE SAME FATE AS ITS BROTHER IN THE CUT-THROAT WORLD OF THE **JURASSIC** SEAS.
EVEN AS THE MOTHER **ICHTHYOSAURUS** DIES, THE REST OF THE POD SWIMS QUICKLY AWAY.

Improve and test your knowledge with...

FACT FILE

Ichthyosaurus holds all the answers. See how you score in the quiz.

It's magic!

In 1922 Sir Arthur Conan Doyle, creator of Sherlock Holmes and author of The Lost World, astounded a meeting of the Society of American Magicians in New York by showing them a film of living dinosaurs. This actually turned out to be the special effects scenes from the film of The Lost World that was currently being made. The film was finally released in 1924.

Minicroc

Alligatorellus was a tiny crocodile, only 30 cm long, from the Late Jurassic Period in Europe. Not very fierce, it only ate insects.

1 ***Archelon* grew up to:**

a) 8.3m long
b) 1.5m long
c) 3.7m long

2 **What is a tuatara?**

a) a large lizard
b) a big turtle
c) a flat fish

3 ***Pteranodon* was as heavy as:**

a) a small child
b) a calf
c) an elephant

4 **What was the first-known ground beetle called?**

a) coelacanth
b) tarsier
c) *Protorabus*

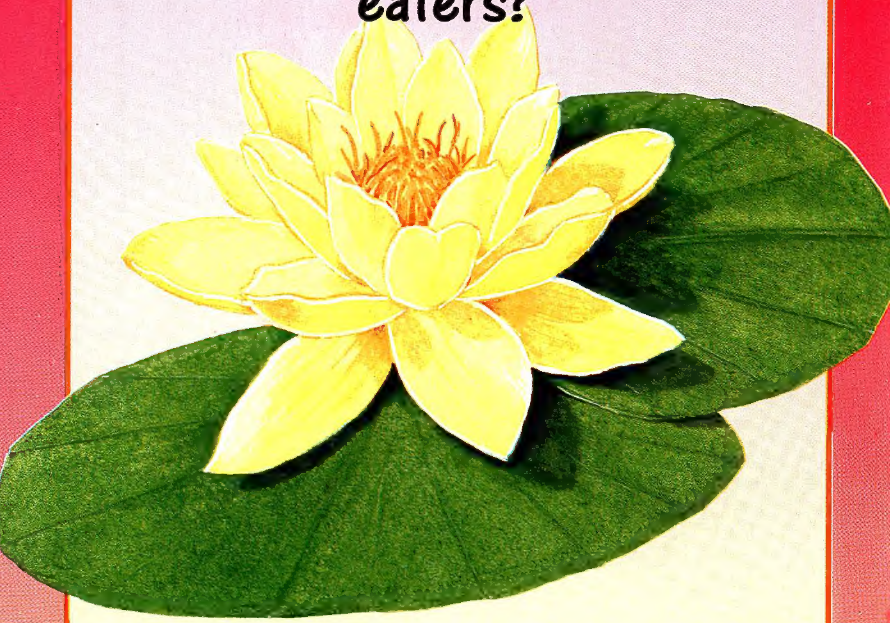
5 **A *Prolibytherium* had:**

a) a long, thin nose
b) leaf-shaped antlers
c) big ears

Thunderbones

When native Americans first found the bones of the giant brontotheres, they thought they were from the great birds of their myths that brought thunder.

Food for Triassic plant-eaters?



The first flowers appeared during the Cretaceous Period – or that's what experts believed... But the latest research indicates that there may have been flowers, such as this ancient water-lily, 100 million years earlier! Triassic dinosaurs may have enjoyed a more varied and colourful diet than we thought!

6 ***Diplocaulus*** **had a head like:**

a) a rugby ball
b) a football
c) a boomerang

7 ***Ankylosaurus'*** **most important weapon was:**

a) its sharp teeth
b) its tail club
c) its horn

8 ***Icaronycteris*** **found its prey by:**

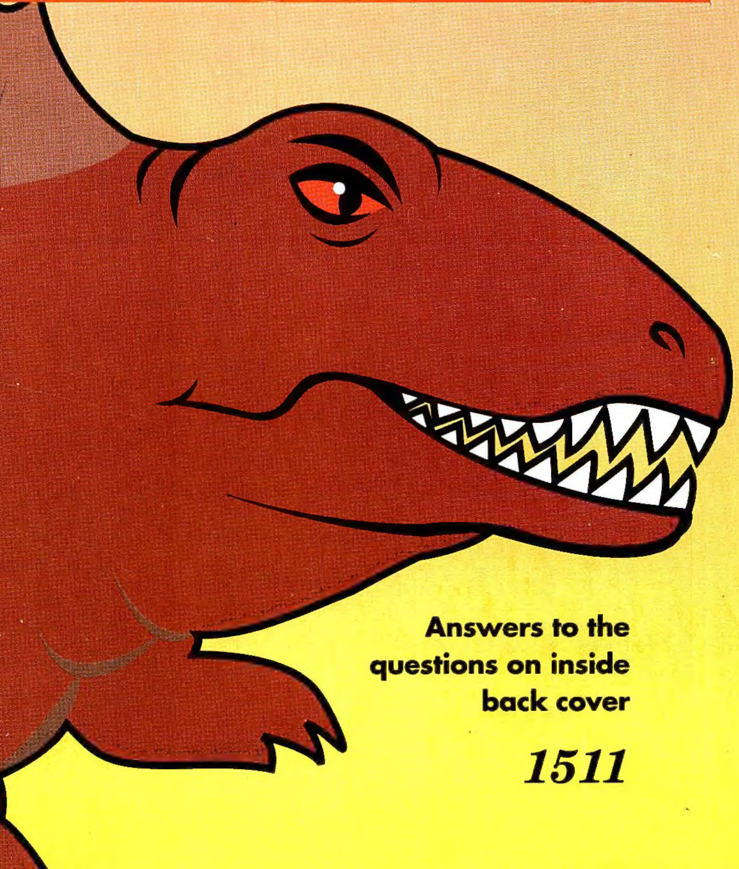
a) noselocation
b) earlocation
c) echolocation

9 **An African elephant's ears are:**

a) 90cm wide
b) 1.8m wide
c) 2.5m wide

10 **Where did life first start?**

a) in the water
b) on Mars
c) in volcanoes

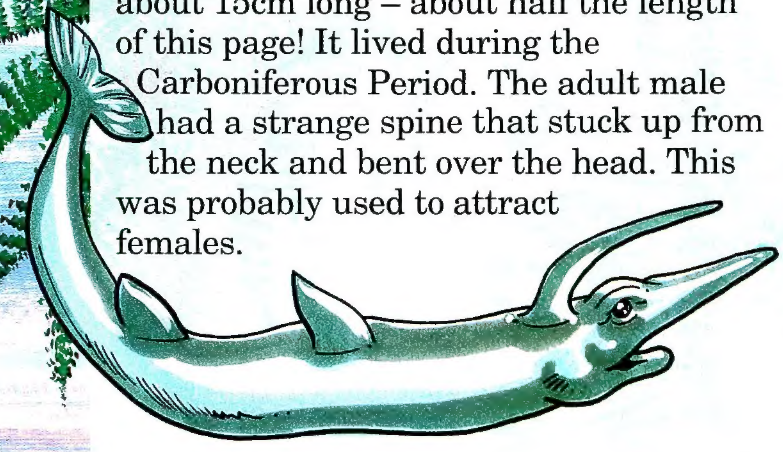


Answers to the questions on inside back cover

A to Z OF PREHISTORIC ANIMALS FA – GR

FALCATUS 280 MYA

Falcatus (fal-cah-tus) was a small shark about 15cm long – about half the length of this page! It lived during the Carboniferous Period. The adult male had a strange spine that stuck up from the neck and bent over the head. This was probably used to attract females.



FELIS LEO SPELAEUS 1 MYA

Felis leo spelaeus (fee-lis lee-o spee-lee-us) was about 4m long – longer than the biggest living lion. Its name means 'cave lion' and it lived in Europe in the middle of the Pleistocene Epoch. A fierce carnivore, *Felis leo spelaeus* pursued big plant-eaters on its four strong legs and attacked them with its sharp claws. Like the cheetah of today, this big cat used its huge biting power to overcome its prey.

G

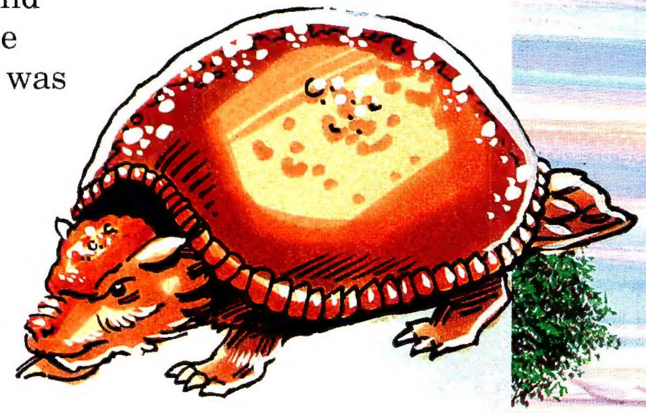
GALEPUS 250 MYA

Galepus (gal-e-pus) was an insect-eating, mammal-like reptile that lived in the Permian Period in South Africa. About the size of a rabbit, *Galepus* walked on four legs and had a long tail.

MYA = MILLION YEARS AGO

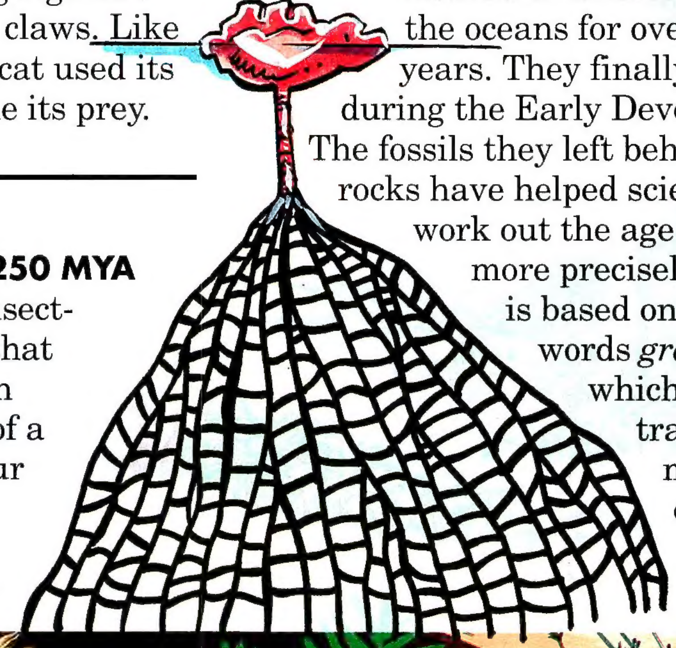
GLYPTODON 5 MYA

As long as a car, *Glyptodon* (glip-toh-don) was almost eight times the size of its living relative, the armadillo. It carried a great domed shell on its back and moved slowly on four short legs. Its small brain was protected by a bony skullcap. *Glyptodon* lived in both Pliocene and Pleistocene times and was found in South America. Its name means 'carved tooth'.



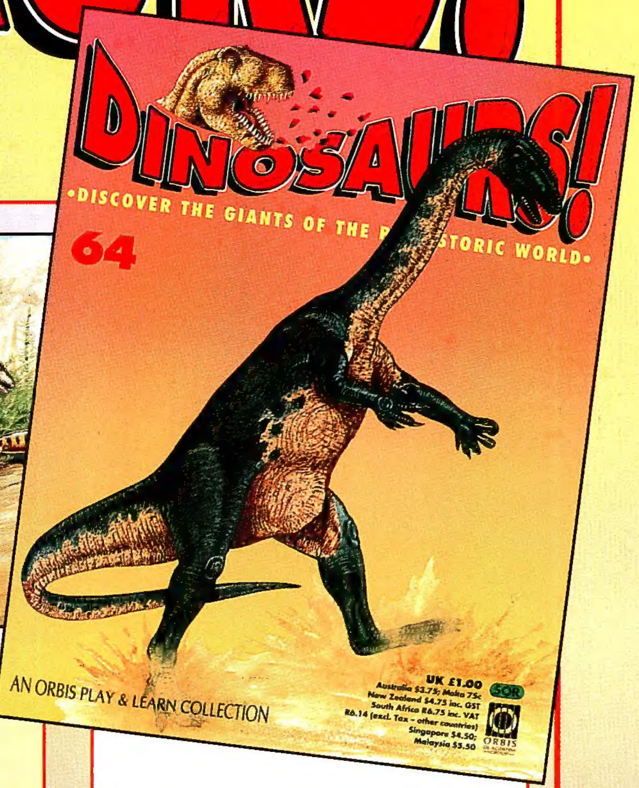
GRAPTOLITE 500 MYA

Graptolites (grap-toh-lytes) were minute, stalked creatures that lived in the oceans for over 100 million years. They finally disappeared during the Early Devonian Period. The fossils they left behind in the rocks have helped scientists to work out the age of those rocks more precisely. Their name is based on the Greek words *graphos lithos* which, roughly translated, means 'writing on stone'.



COMING IN PART 64 OF

DINOSAURS!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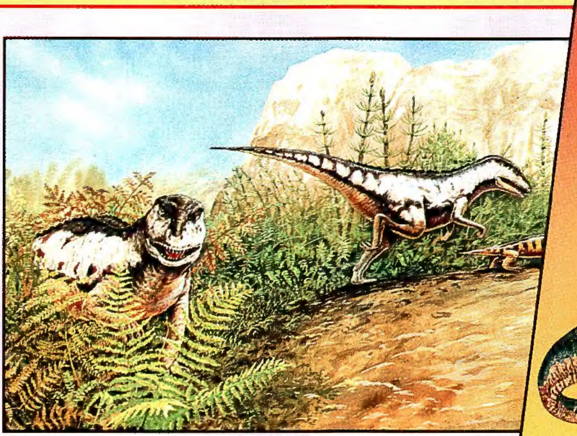
The story of the prehistoric animals trapped in tar in TIME DETECTIVE. Sharks and dinosaurs feature in IDENTIKIT.



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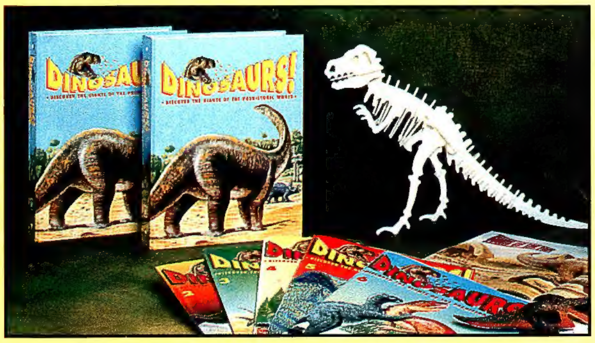

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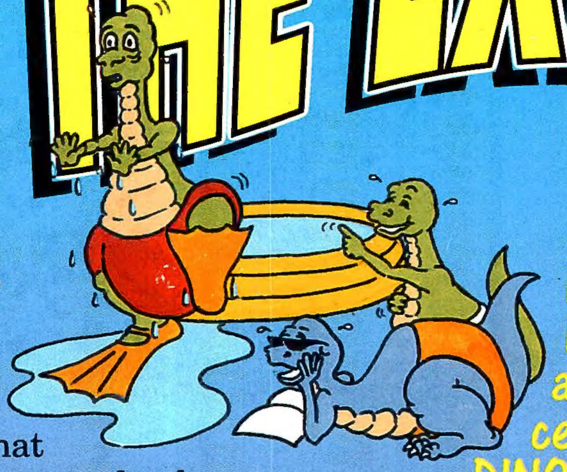
ANSWERS TO FACT FILE QUESTIONS: 1.c 2.a 3.a 4.c 5.b 6.c 7.b 8.c 9.b 10.a

Dr David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT

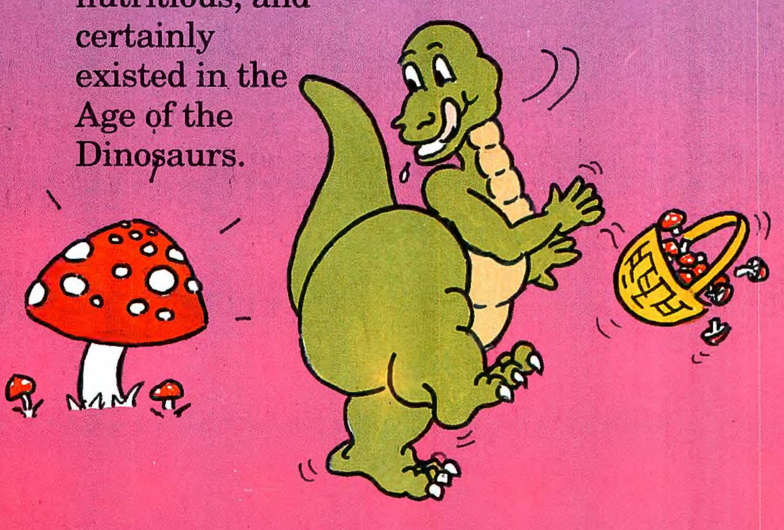


Did swimming reptiles suffer from the bends?

Any swimming creature that breathes air and dives to a great depth risks getting the 'bends'. This painful, sometimes fatal, condition is caused by bubbles in the blood. Oxygen dissolves in the blood at high pressure and the deeper the water, the greater the pressure. If an animal comes up too quickly from the ocean depths, the oxygen dissolved in the blood can form bubbles. Whales, which dive to great depths, breathe out before they dive so that less air is in their lungs.

Would dinosaurs have eaten mushrooms?

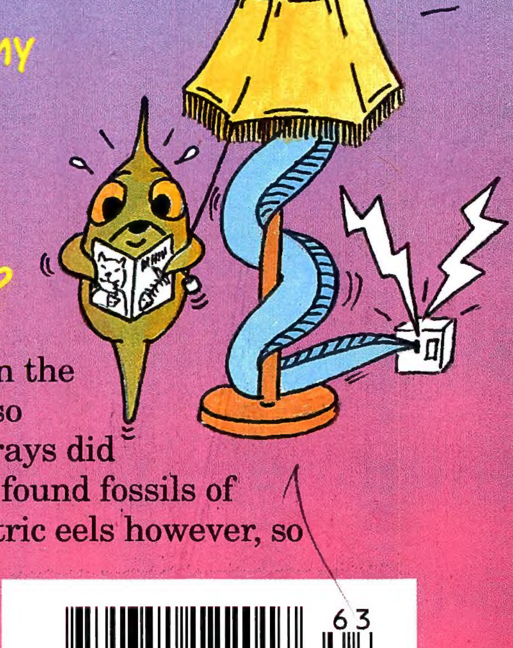
I see no reason why some dinosaurs could not have eaten mushrooms. They are very nutritious, and certainly existed in the Age of the Dinosaurs.



In most books the horned dinosaurs are called ceratopsians. But in DINOSAURS! they are called ceratopians Why?

The reason for calling horned dinosaurs ceratopians is that this is the correct spelling! This comes from knowing the meaning of the word. Ceratopsian is often used in dinosaur books, even though technically it is incorrect. I like to use the correct name.

Were there any prehistoric electric fish, like electric eels and electric rays?



Rays did exist in the Mesozoic seas, so maybe electric rays did too. We haven't found fossils of prehistoric electric eels however, so perhaps only cartilaginous fishes had electric relatives.

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